UNIVERSITY OF ARIZONA
BUREAU OF APPLIED RESEARCH IN ANTHROPOLOGY

YEAR ONE REPORT

Project Title: **Use And Usefulness: A Comparative Study Of Seasonal Climate Forecasting Systems In Drought-Affected Regions Of Latin America**

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Project Activities to Date:

This project compares the use of climate information in policy-making in two semi-arid regions of South America—the state of Ceará, Northeast Brazil, and Region IV (La Serena) in Chile. During the first nine months of project activities, the research teams in each country were assembled and specific research plans were prepared. As specified in the project proposal, two team meetings were held and are described in detail below.

- **The first was a ten-day field visit in October to Chile. The visiting team consisted of co-PIs Finan, Lemos, and Nelson; Brazilian colleagues, Dario Mayorga (Universidade Federal do Ceará) and Roberto Sergio Souza Farias (FUNCEME); and climate researchers from Mexico and Argentina. During the first two days, a climate and vulnerability conference was held at the University of Chile organized by co-PI Leon and team members Milka Castro and Miguel Bahamondes. This conference provided detailed**

descriptions of Region IV, of the state of climate forecasting in Chile, and the role of government in the mitigation of climate-based crises. The conference was followed by a field trip to Region IV, by land transport, over a period of five days. The team visited small-scale communal farmers (comuñeros) as well as medium and large scale growers of fruit and grapes for export. In La Serena the team made a presentation to a wide range of public officials responsible for agriculture, drought mitigation, and public policy in the region. During this trip to Chile, the Brazilians, Chileans, and the U.S. based project members had ample time to discuss the important climate issues and the research methodology in Chile.

- **The second was a eight day trip from Chile to Ceará during the first week of December. The visiting team members from Chile included Leon, Castro, and Bahamondes. During this trip, the visiting project team was introduced to both the Universidade Federal do Ceará (Department of Agricultural Economics, primarily), to FUNCEME (the state climate forecasting agency), and to SEPLAN (the Secretariat for Planning, where all drought policy is formulated and coordinated). The entire project team then visited the field sites in Limoeiro do Norte and Boa Viagem, in the interior of the state. In each município, the group met with different kinds of farmers, local government representatives, and other informal leaders. At the end of the field trip, the group met in Fortaleza to plan out the fieldwork and methodology in Chile. The opportunity to compare both study sites and approaches was extremely beneficial to both country teams.**

In addition to the team meetings, substantial progress was achieved in the fieldwork phases in both countries. A detailed description of each follows:

Brazil

While co-PI Finan was on sabbatical leave with the Universidade Federal do Ceará (UFC), the field research was designed and initiated. The previous three years of research succeeded in identifying the vulnerabilities of different farmer groups throughout the state. Since this research revealed that the most vulnerable groups of farmers are those who benefit least from climate information, the research focused on the use of climate information by local policymakers. The research question was defined as: How could a município leader, the prefeito (roughly, mayor) use climate forecasts to mitigate the impacts of drought? The research strategy then was to ascertain the kind of information tools that the prefeito would need to do such proactive drought planning. To achieve this strategy, we designed a method of "vulnerability mapping" at the município level in order to use as a planning tool. Thus, the research goals of this first year are to generate the município vulnerability map, present this product to a cross-section of local officials both formal and informal, and facilitate the creation of a drought plan to be mobilized in the event of a projected drought. Two municípios were identified as pilot areas, but the Secretariat of Planning requested that the pilot areas be

extended to five. Additional funding from NOAA was approved to cover the increased field expenses.

The first nine months have witnessed the following achievements. First, we were able to create an effective research partnership between the state-level Secretariat of Planning, the Universidade Federal do Ceará, and the local-level Prefeituras. The second was to identify and train the team members, which was completed in December at the State Rural Extension training center over a period of three days. Over 20 people participated in this training, including team members from the local municípios. In January, intensive fieldwork was carried in Boa Viagem and in February, the município of Tauá was completed. This fieldwork involved field teams comprised of UFC project members and students, SEPLAN team members, and local partners. All travel support was provided by the State of Ceará. These data are now being analyzed and digitized onto the vulnerability maps. It is projected that this summer, the first maps will be completed and presented in two-day workshops in the two municípios. In the meantime, the state government has suggested that the project methodology be used as a tool for local planning in 100 of the state's municípios in order to generate a state-level drought plan. We expect to have local level drought plans ready by the middle of the fall and prior to the December seasonal forecasts.

Chile

Over the last nine months, the Chile team has identified and trained the research team and developed their fieldwork strategy. During the month of April the core team (Leon, Castro, Bahamondes) returned to Region IV to conduct a rapid assessment of the proposed field sites. One of the major concerns was to define common research questions across the two countries (and regions) and to adopt similar methodologies that will facilitate cross-country comparisons and insights. It was decided that the sample of stakeholders will include both the small scale comuñeros and the export-oriented growers. Also, the research instrument used in Brazil was adopted to the Chilean context.

The Comunidades Agricolas sample includes three sites—Carquindano, El Tome, and El Durazno. The team has quantitative information on all three of these communities from previous research (carried out by Bahamondes and Leon), but the more qualitative components of the methodology need to be applied. Along with the irrigated growers, the sample will represent different precipitation regimes from north to south. The northernmost is the município of Rio Hurtado where the growers are small-scale and depend on the river for irrigation water. This is no public infrastructure in this valley. The team will then work the Limari watershed where the large Paloma dam manages irrigation water for medium-sized growers of annual crops. Here the team will work in the município of Ovalle, where El Durazno is located and in the município of Monte Patria, where the Comunidad El Tome is located. Here the sample will include growers from the Rio Guatulame valley, where irrigation water comes from both a reservoir and directly from the

river. The differing access to irrigation water during a drought is a central issue here. The southernmost location is Carquindano and Mincha. Here small scale agriculture depends on the Choapa River, which runs high because of proximity to the mountain sources. However, there is also competition for this water with big mining concerns upstream.

The project team has formed a partnership with the Universidad de La Serena and will use student interviewers (about 12) from this institution. These students already have research experience in the region. Milka Castro will assume responsibility for the policy interviews with decision-makers and public officials such as rural extensionists, water managers, union and association leaders, etc. The field research will be carried out during the summer with preliminary reports completed by fall.

The purpose of this research is to define the vulnerability of different rural stakeholders to climate variability and to document the public role in relation to climate-based crisis. This first phase of the work will focus primarily on the vulnerability assessment activity.

Results and Insights from Year One

In the case of Chile, it is premature to discuss first year field results, which will become available in early fall. Nonetheless, the points of comparison and contrast between the Ceará and Chilean case did become apparent during this reporting period:

- **There is no effective, state-funded climate forecasting infrastructure that contributes to public policymaking in Chile, in contrast to Ceará where the public investment in forecasting systems has been exceedingly high. On the other hand, Chile has an active private market for forecast information that does not exist in Brazil. This difference will constitute a major focus in the analysis of the data.**

- **The overall public role in mitigating climatic crisis appears much reduced in Chile, while in Brazil a drought engenders a widespread public response. In neither case does proactive drought planning seem well advanced.**

- **The nature of vulnerability in Chile will mostly involved issues of water management and water rights negotiated among stakeholders, while in Brazil the water management is much more centralized and politicized.**

Specifically in the case of Ceará,

- **This project has had a major influence on policymaking in the state of Ceará. First, it has demonstrated that the appropriate use of climate forecasting as a "new technology" in the hands of policymakers must be learned over time. It**

is only now that policymakers in the state are beginning to use climate forecasts as a planning tool. The change in perception away from drought as an abnormal climatic event toward drought as part of the reality of a semi-arid environment has pervaded most levels of state government. Thus, the widely-accepted goal is thus to not be caught unawares in the advent of the next drought, but to plan as if drought might occur next year. Then the forecast becomes a trigger in the process, mobilization a series of actions designed to mitigate the impacts.

- **Local vulnerability maps are effective tools for planning at the local level. They present an objective and transparent reality with regard to climate variability. It is possible that local governments will set priorities in response to other kinds of realities (i.e., political ones), but they do so in the face of very public information about where the greatest vulnerabilities lie within the município. It is an immense change to see local authorities talk about vulnerabilities and drought planning.**

- **The focus on local vulnerabilities and planning has also change the way state offices do business. It was standard procedure for state planners to develop state-level programs, then seek municípios to participate. With this project, the municípios develop the plans, then pass them onto state offices for resource allocation decisions.**

- **The project has developed a methodology for research and planning that is unique in climate applications. The methodology for vulnerability mapping uses a GIS framework for organization of data layers and includes all the secondary data (on water sources, infrastructure, drainage, land use) available in state planning offices. With this basic data set, the methodology has designed a community sampling process and a participatory research approach to involve local populations in the actual definition of their own vulnerability.**

- **The team organized a major, two-day workshop of stakeholders and policymakers in August. With over 80 attendees, the conference was widely disseminated over newspaper and television.**

Plans for Year Two

In the case of Chile, the second year will begin with a profile of Region IV vulnerabilities and a description of the national, regional, and local responsibilities for mitigation policymaking. The second year will expand the vulnerability analysis to the northeast, where the stakeholder groups include the Native American communities and the mining interests of the country. The project will begin to open the public policy dialogue with regard to climate vulnerability and the role of the state through a series of public workshops to disseminate project results.

In Brazil, the team will carry out the pilot planning process indicated above, then seek to simplify the participatory research methodology in order to apply it on a more massive scale as part of the state planning process using local government representatives. It is our intent to institutionalize the localized planning process with regard to drought mitigation and the reduction of basic vulnerabilities.

In addition, the group has proposed two professional sessions on climate information and public policy for the international IHDP meetings in Rio in October of this year. These sessions compare the Chilean and Brazilian case studies along with a theoretical paper on the nature of climate vulnerability.

The entire team will meet in Tucson, prior to the Rio meetings in order to compare findings, plan for the second year, and set up a schedule for publication and dissemination of results.

Along with the publications that have already resulted from this project, a book manuscript on the Brazil case is now underway in both English and Portuguese.

Respectfully submitted,

Timothy J. Finan
Co-PI

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